

CLAIMS:

1. A method of electrolessly depositing a metal on at least a part of the surface of a silicon wafer substrate, comprising:

(a) contacting the silicon wafer substrate with a solution comprising non-precious metal ions so as to obtain a wafer substrate covered with non-precious metal ions; and

(b) exposing the wafer substrate obtained in step (a) to a reducing solution comprising a reducing agent for reducing the metal ions that cover said substrate to a lower oxidation state.

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2. The method according to claim 1, further comprising the step of :

(c) contacting the wafer substrate obtained in step (b) with an electroless copper plating solution.

3. The method according to claim 1, wherein at least one of steps (a) and (b) is carried out by puddle processing.

4. The method according to claim 2, wherein at least one of steps (a), (b) and (c) is carried out by puddle processing.

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5. The method according to claim 1, wherein said reducing agent used in step (b) comprises a borane reducing agent.

6. The method according to claim 1, wherein said reducing solution used in step (b) comprises at least one metal ion of group Ib of the periodic table.

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7. The method according to claim 2, wherein said deposited metal is copper.

8. The method according to claim 1, wherein the wafer substrate is scanned with a laser following step (b).

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9. The method according to claim 2 further comprising during or after step (b), selectively scanning the wafer substrate with laser radiation in a predetermined manner.

10. The method according to claim 2 further comprising during or after step (c), 5 selectively scanning the wafer substrate with laser radiation in a predetermined manner.

11. A method for forming a copper pattern on a silicon wafer substrate comprising (a) contacting the silicon wafer substrate with a solution comprising non-precious 10 metal ions so as to obtain a wafer substrate covered with non-precious metal ions; (b) exposing the wafer substrate obtained in step (a) to a reducing solution comprising a reducing agent for reducing the metal ions that cover said substrate to a lower oxidation state; and (c) contacting the wafer substrate obtained in step (b) with an electroless copper plating solution. 15

12. The method according to claim 11, further comprising during or after step (b), selectively scanning the wafer substrate with laser radiation in a predetermined manner.

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13. The method according to claim 11, further comprising during or after step (c), selectively scanning the wafer substrate with laser radiation in a predetermined manner.

14. A product of manufacture obtained by the method of claim 2. 25

15 A product of manufacture obtained by the method of claim 11.

16. A method of repairing dishing defects of copper on a ULSI device, comprising contacting at least said defected area of said device with electroless copper solution.

17. The method according to claim 16, wherein the electroless copper solution 5 comprises formaldehyde reducer.

18. The method of claim 16, wherein the electroless copper solution comprises hypophosphite reducer.

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19. The method according to claim 16, further comprising delivering radiation energy to at least said defected area, before, during, or after it is contacted with electroless copper.

20. The method according to claim 19, wherein the electroless copper solution 15 comprises hypophosphite reducer.

21. The method according to claim 16, further comprising before contacting at least said defected area of said device with electroless copper solution, the following steps: contacting at least said defected area with a solution comprising non-precious 20 metal ions; and then exposing said defected area to a reducing solution comprising a reducing agent.